

## Potomac Electric Power Company (Maryland)

### Smart Grid Project

#### Abstract

The Potomac Electric Power Company—Maryland (Pepco) Smart Grid project includes distribution automation, advanced metering infrastructure (AMI), and a demand response program that involves direct load control and time-based rate programs. The AMI installation is designed to provide customers and Pepco with detailed electricity usage information, which, when combined with demand response programs, can help customers reduce their electricity usage and manage their electricity costs. The distribution automation deployment includes automated distribution circuit switches and transformer monitors that can improve the reliability of the distribution system while decreasing the cost of operations and maintenance.

#### Smart Grid Features

**Communications infrastructure** involves components of the wireless AMI mesh network. The system has the capability to route traffic through the AMI meters, and Pepco is designing the system to route distribution automation traffic through battery-backed wireless communications devices. This approach ensures that distribution automation traffic remains on energized communications devices during power outages. The system uses the same backhaul communications systems to transport AMI and distribution automation data to the appropriate end points.

**Advanced metering infrastructure** includes the installation of 550,000 smart meters across Pepco's Maryland service territory. These meters record electricity usage for time intervals of an hour or less, and can be used by Pepco to detect power outages and provide notification to the utility. AMI supports demand response and time-based rate programs and reduces the cost of meter operations.

**Advanced electricity service options** offered through the project include a Web portal for electric customers to access their consumption data and programmable communicating thermostats. The Web portal allows customers to view the data collected from their smart meters, giving them information with which to manage their consumption and costs. The Web portal also provides the platform for control of new programmable thermostats. Net metering programs to enable distributed generation are also being offered.

#### At-A-Glance

**Recipient:** Potomac Electric Power Company (Maryland)

**State:** Maryland

**NERC Region:** ReliabilityFirst Corporation

**Total Budget:** \$209,561,098

**Federal Share:** \$104,780,549

**Project Type:** Integrated and/or Crosscutting Systems

#### Equipment

- 550,000 Smart Meters
- AMI Communication Systems
  - Meter Communications Network
  - Backhaul Communications
- Meter Data Management System
- Customer Web Portal
- Programmable Communicating Thermostats
- 168,000 Direct Load Control Devices
- Distribution Automation Equipment for 67 out of 685 Circuits
  - Distribution Automation Communications Network
  - SCADA Communications Network
  - Automated Distribution Circuit Switches
  - Circuit Monitors/Indicators

#### Time-Based Rate Programs

- Time of Use

#### Key Targeted Benefits

- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Equipment Failures and Theft
- Reduced Greenhouse Gas and Criteria Pollutant Emissions
- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Reduced Truck Fleet Fuel Usage

**Potomac Electric Power Company (Maryland)** (continued)

**Direct load control devices** deployed by the project include 168,000 AMI-enabled load control devices for cycling residential air conditioning equipment. The aim is to lower operating costs and defer capacity additions through reductions in peak demand. Participating customers have the opportunity to lower their bills through financial incentives for contributing load reductions.

**Time-based rate programs** include customer options to enroll in time-of-use programs. The time-of-use program is aimed at encouraging participating customers to shift their consumption from on-to off-peak periods, thus reducing peak demand and lowering Pepco's operating costs.

**Distribution automation systems** include new automated distribution switches, sensors, and transformer condition monitors as well as upgrades to supervisory control and data acquisition (SCADA) systems. These devices are intended to reduce the time to detect and isolate power outages and increase the reliability of the distribution system. The cost of distribution operations and maintenance is also expected to decrease.

**Timeline**

Key Milestones	Target Dates
Direct load control installation start	Q2 2010
Distribution automation installation start	Q2 2010
AMI installation start	Q2 2011
AMI installation complete	Q4 2012
Distribution automation installation complete	Q2 2013

**Contact Information**

Sunil Pancholi  
Business Support Manager—DOE & NERC  
Pepco Holdings, Inc.  
svpancholi@pepco.com